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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,516	12/12/2003	Cormac Herley	MCS-061-03	9986
27662	7590	06/06/2007	EXAMINER	
MICROSOFT CORPORATION			HUNG, YUBIN	
C/O LYON & HARR, LLP			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/734,516	HERLEY, CORMAC	
	Examiner	Art Unit	
	Yubin Hung	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-3 and 5-24 is/are rejected.
- 7) Claim(s) 1 and 4 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 12 December 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 9/29/05.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application
- 6) Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 1 objected to because of the following informalities in line 6 "of list" should have been "a list of"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 13 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claim 13 recites the limitation "the histogram" in line 8. Since there are more than one histogram (at least one each for a row and a column), it is not clear which one is being referred to; therefore the mete and bound of the claim cannot be ascertained.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 1-3, 5-7, 9, 11-14 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 7, 085,413) and further in view of Nishida et al. ("Restoring Color Document Images with Show-Through Effects by Multiscale Analysis," SPIE Vol. 5008, Conf. date: 01/21/03, pp. 70-80).

7. Regarding claim 13, Huang discloses computing a color histogram [Fig. 1, ref. 13]; determining a most common pixel color in the histogram, designating the color as a background color if its frequency is greater than a threshold and adding the color as a candidate background color [Fig. 2, refs. 21 (most common frequency compared to a threshold) and 22 (add to candidate list); Col. 3, lines 18-23]; computing and designating the most common candidate color as the background color [Fig. 2, refs. 21, 22, 24]. Note that following steps 21, 22 and 24, the list has only one candidate, which is by default the most common one and is designated as the estimated background color. Note further that in one embodiment THR_W of step 22 is 0 and in this case it is disabled (Col. 3, lines 39-40)].

Huang does not expressly disclose that a histogram is computed for each row and each column and that the most common candidate color is selected from the candidate list formed over all histograms. However, Nishida teaches analyzing each row and column in order to determine the background color [Fig. 5; P. 96, P. 76, 3rd and 4th paragraphs] and computing and analyzing of histograms, as disclosed by Huang above, is a well known and widely used analytical technique applicable to the rows and columns. [Note that Huang discloses choosing the color with the highest frequency as the background color. It would therefore have been obvious to choose the highest-frequency one of candidate backgrounds colors determined for each row and column as the overall background color. Note further that implementing a method in a computer program and store it in a computer-readable medium (e.g., a CD-ROM, a floppy disk, or a hard disk, etc.) is well known and commonly practiced so as to obtain tangible results (by implementing as a computer program) as well as for portability by storing in a medium.]

Huang and Nishida are combinable because they both have aspects that are from the same field of endeavor of image processing using histograms.

At the time of the invention it would have been obvious to modify Huang with the teachings of Nishida as recited above (note that each row or column is an image by itself). The motivation would have been to avoid distortion that can arise when the

image area used to estimate the background color is too large, as Nishida indicates in P. 74, last five lines of the 2nd paragraph (beginning with "We first consider").

Therefore it would have been obvious to combine Nishida with Huang to obtain the invention of claim 13.

8. Claim 1, and similarly claims 2, 12 and 18, is similarly analyzed and rejected as per the analysis of claim 13 since a histogram is a frequency distribution.

9. Regarding claim 3, note that the Nishida discloses histograms for rows and columns.

10. Regarding claim 5, note that the Huang discloses selecting the most common color for the histogram [Fig. 2, ref. 21].

11. Regarding claim 6, note that the Huang discloses selecting the most common color for the histogram as a candidate if it is greater than a threshold [Fig. 2, ref. 21].

12. Regarding claim 7, and similarly claim 14, Huang further discloses the use of a threshold of appropriate value [Fig. 2, ref. 21 "THR_P"; Col. 3, lines 18-23]. However, Huang does not disclose expressly that THR_P is the target limitation of approximately 90%.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to apply target limitation. Applicant has not disclosed that target limitation provides an advantage, is used for a particular purpose or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with either THR_P taught by Huang or the claimed target limitation because both threshold perform the same function of determining whether to consider the most common color as a candidate color.

Therefore, it would have been obvious to one of ordinary skill in this art to modify Huang with the target limitation to obtain the invention as specified in claim 7.

13. Regarding claim 9, note that per the analysis of claim 1 the combined invention of Huang and Nishida discloses generating histograms for each of the rows and the columns.

14. Claims 8, 10, 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 7, 085,413) and Nishida et al. ("Restoring Color Document Images with Show-Through Effects by Multiscale Analysis," SPIE Vol. 5008, Conf. Date: 01/21/03, pp. 70-80) as applied to claims 1-3, 5-7, 9, 11-14 and 18 above, and further in view of Sato (JP 40-108227).

15. Regarding claims 8 and 10, and similarly claims 15 and 16, the combined invention of Huang and Nishida discloses all limitations of their respective parent, claims 1 and 13.

The combined invention of Huang and Nishida does not expressly disclose the following, which is taught by Sato

(Claim 8) determining a variance of the estimated background color
(Claim 10) obtaining a variance of the estimated background color from its histogram and using the variance in another image processing technique used on the scanned image
[English abstract; Fig. 1, refs. 5 (compute variance), 7 (compute threshold). Note that the threshold is used for binarization ("another image processing technique")]

The combined invention of Huang and Nishida is combinable with Sato because they both have aspects that are from the same field of endeavor of image processing using histograms.

At the time of the invention it would have been obvious to modify the combined invention of Huang and Nishida with the teachings of Sato as recited above. The motivation would have been to be able to calculate a threshold level for binarization even when the size of the object of interest is unknown, as Sato indicates in lines 1-2 of the English abstract.

Therefore it would have been obvious to combine Sato with Huang and Nishida to obtain the inventions of claims 8, 10, 15 and 16, respectively.

16. Claims 11, 17 and 19-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huang et al. (US 7, 085,413) and Nishida et al. ("Restoring Color Document Images with Show-Through Effects by Multiscale Analysis," SPIE Vol. 5008, Conf. Date: 01/21/03, pp. 70-80) as applied to claims 1-3, 5-7, 9, 11-14 and 18 above, and further in view of Yaguchi (US 7,099,042).

17. Regarding claim 11, and similarly claims 17 and 19, the combined invention of Huang and Nishida discloses all limitations of its parent, claim 1.

The combined invention of Huang and Nishida does not expressly disclose the following, which is taught by Yaguchi

- dividing the scanned image into separate color components and estimating a background color for each of the color components [Fig. 32, refs S3 & S4; Col. 17, lines 55-59]

The combined invention of Huang and Nishida is combinable with Yaguchi because they both have aspects that are from the same field of endeavor of image processing using histograms.

At the time of the invention it would have been obvious to modify the combined invention of Huang and Nishida with the teachings of Yaguchi as recited above. The motivation would have been to reduce image reading time, as Yaguchi indicates in Col. 1, lines 38-52. (See also Col. 18, lines 1-18 for how the background colors are used for this purpose.)

Therefore it would have been obvious to combine Yaguchi with Huang and Nishida to obtain the invention of claim 11.

18. Regarding claims 20 and 21, note that per the analysis of claim 1 Nishida implicitly selects row and column as the coordinate system and scan the rows and columns [Fig. 5].

19. Regarding claim 22, per the analysis of claim 1 the combined invention of Huang and Nishida discloses that the frequency distribution is a histogram.

20. Regarding claim 23, per the analysis of claim 1 the combined invention of Huang and Nishida discloses analyzing the histogram at least to select largest bin [Huang: Fig. 2, ref. 21].

21. Regarding claim 24, note that in building a color histogram, the color of each pixel is examined and the frequency of each color is obtained.

Allowable Subject Matter

22. Claim 4 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

23. The following is a statement of reasons for the indication of allowable subject matter:

A. Claim 4 recites scanning in two non-orthogonal directions in order to build scan-line histograms. Closest art of record (e.g., Nishida) discloses scanning in orthogonal directions (e.g., rows and columns) but not non-orthogonal ones and it would not have been obvious to do so.

Conclusion and Contact Information

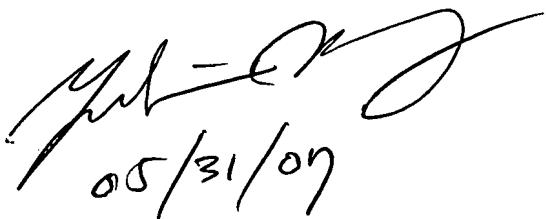
24. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Bereta (US 5,901,243) – discloses computed one histogram for each scan-line [Figs. 2-4]
- Ball (US 6,323,957) – discloses computing statistics for background colors for subsequent processing [Fig. 5A; Col. 5, lines 11-14]
- Cong (US 2002/0154798) – discloses using the variance of background color to determine a threshold for subsequent processing [Fig. 4A, refs. 406 & 408; Fig. 4B; P. 5-6, paragraphs 52 & 53; P. 9, Claim 16, last three lines]

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yubin Hung whose telephone number is (571) 272-7451. The examiner can normally be reached on 7:30 - 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew C. Bella can be reached on (571) 272-7778. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2624

26. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



A handwritten signature in black ink, appearing to read "Yubin Hung". Below the signature, the date "05/31/07" is written in a smaller, slanted font.

Yubin Hung
Patent Examiner
Art Unit 2624
May 31, 2007